Title: Division at the Carnival

Brief Overview:

Students will explore and practice various strategies for long division in order to be more accurate in their work. They will begin by estimating quotients to see the value of it in the real world and as a means to ensure realistic quotients when dividing. Students will also learn and practice new strategies for long division in order to provide another option for dividing successfully. By the end of the unit students will analyze remainders in division problems to determine their importance in analyzing real world situations.

NCTM Content Standard:

- Develop and use strategies to estimate the results of whole-number computations and to judge the reasonableness of such results;
- Understand the effects of multiplying and dividing whole numbers;
- Identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems;
- Develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 30 x 50;

Grade/Level:

Grade 5

Duration/Length:

3 sessions, for 60 minutes a session

Student Outcomes:

Students will:

- Estimate the quotient in order to determine reasonableness of their result;
- Use multiple strategies for determining the quotient and checking their results;
- Interpret the remainders of the various problems in order to apply results to real world application.

Materials and Resources:

Day One

- Student resource "Preassessment"
- Teacher resource "Preassessment"
- Divide and Ride by Stuart J. Murphy
- Chart paper

- Student resource “Estimating Quotients Directions”
- Dry Erase Boards with Markers or Mini Chalk Boards with Chalk or Paper and Markers
- Teacher resource “Estimating Quotients: Teacher Sample Problems”
- Teacher resource “Estimating Quotients: Teacher Sample Problems-Answers”
- Student resource “Division Problem Cards-On”
- Teacher resource “Division Problem Cards-On Answers”
- Student resource “Division Problem Cards-Reteach”
- Teacher resource “Division Problem Cards-Reteach Answers”
- Student resource “Division Problem Cards-Enrichment”
- Teacher resource “Division Problem Cards-Enrichment Answers”
- Student resource “Estimating Quotients Bingo”
- Scissors
- Overhead markers
- Baggies (or something to place cards in and draw from)
- Internet to access http://www.ixl.com/math/practice/grade-5-estimate-quotients-word-problems (optional)
- Student resource “Estimating Quotients Exit Pass”
- Teacher resource “Estimating Quotients Exit Pass Answers”

Day Two

- Paper balls
- Trash can or container
- Spray bottle
- Student resource “Division Strategy Notesheet”
- Student resource “Dynamite Division Directions”
- Chips or marker
- Calculator
- Student resource “Dynamite Division Cards”
- Student resource “Dynamite Division Game Board”
- Student resource “Division Strategy Exit Pass”
- Teacher resource “Division Strategy Exit Pass Answer Key”
- Internet to access http://www.ixl.com/math/practice/grade-5-divide-by-2-digit-numbers-word-problems

Day Three

- Cups
- Paper balls
- Teacher resource “Carnival Scenarios”
- Teacher resource “Carnival Scenarios Answer Key”
- Student resource “Interpreting Remainder Notesheet”
- Student resource “Interpreting Remainder Division Problem”
- Internet access to http://www.ixl.com/math/practice/grade-5-divide-by-1-digit-numbers-interpret-remainders

- Student resource "Calculating Carnival Division Assessment"

- Teacher resource "Calculating Carnival Division Assessment"

Development/Procedures:

Day 1

Pre-assessment

Provide each student with the student resource, "Preassessment" worksheet. They will need to initially estimate the quotient. Then, they will have the opportunity to show multiple methods of solving the division problem. They will need to explain their thinking through words, numbers, and/or symbols. See "Preassessment Answer Key."

Engagement

In this unit, the carnival theme will be integrated. Begin by reading Divide and Ride by Stuart J. Murphy. This picture book teaches division as a group of friends go on various carnival rides.
After reading the picture book, discuss the purpose of division with the students. Explain that over the next few days they will practice dividing using multiple methods and strategies in order to make division more enjoyable for the students.

Exploration

- Begin by discussing the word estimation. Ask: "Why do we estimate?" Create a list on chart paper of real life situations where they estimate in the world. (Going into a store and determining ahead of time if you will have enough money to purchase specific items; determining how many cds or books can fit on a shelf.)
- Write on the board the following **bold** problems:
  Estimate:

346 + 15 =	**789 – 34 =**	**562 x 22 =**	**437 ÷ 7 =**
300 + 20 = 320	*800 – 30 = 770*	*600 x 20 = 12,000*	*420 ÷ 7 = 60*

  Choose students to come to the board to solve each problem. After they finished, ask them to tell you how they estimated the addition, subtraction, and multiplication problems (Round each number to the highest place value-answers italicized under each problem). Ask: "Can you round the dividend and divisor? (No) Why not?" (400 cannot evenly divide into 7. The goal is to find compatible numbers in order to divide quickly and without a remainder.)
  Discuss the word "compatible". In terms of division, compatible numbers relate to fact families. You want to find dividends and divisors that relate to each other, while staying as close to the actual number as possible.

Explanation

- Distribute student resource, "Estimating Quotients Directions." Have students take turns reading the steps. **Please remind students that there are multiple reasonable answers when estimating.**
- Distribute dry erase boards and markers for each student. (If you do not have access to these, distribute mini chalk boards with chalk or paper and markers.) Use teacher resource "Estimating Quotients: Teacher Sample Problems" to display problems on the overhead and have students write responses on their boards while you walk around. Ask them to round the divisor first, then the dividend, and then the quotient. Do this one step at a time and go slow at the beginning. As you walk around, discuss with your students why certain responses are correct or incorrect. In particular, ask why they chose to round the dividend to a particular number, (to stay as close as possible to the actual answer; rounding higher or lower than the original number does not matter as long as you are close to the original). See answer key to assess student understanding.

Application

- Distribute student resource, "Division Cards," and have them cut them into cards. It is recommended that you print on cardstock and laminate prior to this lesson. They can use overhead markers to record their responses. There are 3 versions of this sheet; one for intervention, average, and enrichment. Answers provided for all three are in **bold** underneath the problem, both estimated and actual quotients. (Actual quotients will be needed for Day 2 lesson. You will not use the enrichment sheet on Day 2.)
- Tell students they will work independently to estimate the quotient for each problem and record their responses on the backs of those problems. Direct students to choose 24 quotients to write on their student resource, "Estimating Quotients Bingo," wherever they want. Again, it is recommended that you print on cardstock.
- Divide the students into small groups. Use student resource, "Estimating Quotient Bingo." Tell students to put his or her cards into a baggie so the cards cannot be seen. Ask one student to draw a card, read the problem, and answer aloud. If the group agrees on the answer, and they have that quotient on their game card, they can mark it by putting an X or coloring that box with the overhead marker. The game is over when someone gets five across, horizontally, vertically, or diagonally.
- If computers are available, students can go to: http://www.ixl.com/math/practice/grade-5-estimate-quotients-word-problems to read and solve word problems where they need to estimate the quotient by selecting from multiple answers. Once the students click on a response, if they are incorrect, they can click on "explanation" to see the problem correctly worked out.

Differentiation

Reteach

Determine which students are struggling with this concept by walking around during the exploration process where they are writing on the dry erase boards. These students will work in a smaller setting. If computers are available, practice the problems with them on the site mentioned above. If not, play bingo with them using the student resource, "Estimating Quotients Bingo" in order to discuss the appropriate strategies involved in estimating quotients.

Enrich
Provide these students with the alternate division problems, student resource, "Division Problem Cards-Enrichment" to play Bingo where they explore estimating quotients with decimals in the dividends and divisors.

Assessment
Have students return to their desks to discuss what they learned in today's lesson. Ask: "Why do we need to estimate? What does the term "compatible numbers" mean? What are the steps in estimating the quotient? What is challenging about this concept?" (Tell students that they will explore familiar and new ways to complete long division problems.
Direct students to complete student resource "Estimating Quotients Exit Pass" prior to leaving in order to help you assess their mastery of estimating quotients.

Day 2

Engagement
Tell students that you have decided to volunteer at the carnival in the dunking booth. Explain that students are welcome to come and attempt to dunk you by throwing balls at a target. Use a trash can or some other container that students will attempt to throw a ball into. Make the task challenging so that students are not able to easily accomplish the task. Tell them that if they make the shot, you will allow them to dunk you. Use a spray bottle and allow the student who makes the shot to spray you. Tell the students that you have 15 balls and you will give three students an opportunity to "dunk" you. Call three students up and distribute the balls to each student one at a time until they are all distributed. Ask: "How many chances will each student have to dunk me?"

Exploration

- Distribute a copy of the student resource, "Division Strategy Notesheet." At the top of the sheet ask students to define division in their own words. Allow students time to construct a written response. Circulate throughout the room to ensure that students are completing the task and ask questions to prompt students who are struggling.
- Have students turn to a partner and share answers. Ask students to combine responses to create a definition they both feel is accurate.
- Ask students to meet with another partner to share their responses. When they all agree on a definition, ask them to think of a real life situation where division would be used.

- Have students designate one person to share the group's definition and example for discussion purposes.

Explanation

- Divide the students into two groups based on ability. Explain to students that you are going to be working with one group at a time to teach division strategies. One group will use student resource "Estimating Quotients Bingo" to play a bingo game while the other group will learn division strategies.
- Instruct using the student resource, "Division Strategy Notesheet" and guide students through the two strategies, explaining each step.
- Introduce the traditional algorithm strategy. Have students watch while you demonstrate each step of the example problem. When you are finished, the students may copy it on their papers as you do it again slowly. Instruct students to listen the first time and copy the second time so that they are focused on the explanation of each step.
- Define the purpose of each number using appropriate vocabulary. The number 1,532 is the dividend in the problem. It is the number that you need to divide equally. The number 13 is the divisor, which is the number of groups you need to divide the dividend into equally. The answer to the problem, or the quotient, will be placed on top of the bracket when using the traditional algorithm.

```
    117
13 1532
  -13
   23
  -13
   102
   -91
    11
```

- The quotient is 117 remainder 11
- The thinking line strategy will be introduced next.

13 1532		13 x 1 = 13
-1300	100	13 x 10 = 130
232		13 x 100 = 1300
-130	10	
102		13 x 2 = 26
-26	2	13 x 20 = 260
76		13 x 200 = 2600
-26	2	
50		
-26	2	
24		

$$\begin{array}{r} -13 \\ \hline 11 \end{array} \quad 1$$

- Instruct students to use mental math to multiply the divisor (13) by 1, 10, 100 and then to practice doubling, halving, and manipulating numbers to determine how many groups they can subtract from the dividend until the remainder is smaller than the original divisor. The quotient is 117 remainder 11, which is the same as the quotient from the traditional algorithm strategy. The answer should be the same because the problems are the same but there are many ways to subtract numbers using the thinking line strategy.

Application

- After completing this lesson with the first group, the students will use student resource, "Curly's Calculating Carnival: Dynamite Division" to play the game. Using student resource, "Dynamite Division Cards", students will cut the cards to create a pile face down beside the game board. The students will take turns drawing a card and solving the problems on white erase boards or notebook paper. Once they have completed the problem, they will share their answer with their partner who will check the answer on a calculator.
- If the student has the correct quotient, they may move forward on the game board 2 spaces. If the quotient is incorrect the student will have a chance to fix the problem and have it checked again. If the answer is correct on the second try, the student may move forward 1 space. If the problem is still incorrect, the student must stay in the same space. The first person to reach the finish line is the winner.

Differentiation

Reteach
Allow any students who need extra support on the division strategies to play the game in teams of four so that each person can work with a partner to work through the strategies. Students having the most difficulty can play a game with you or an adult monitoring and intervening during times of difficulty.

Enrich
Students who have played the game successfully and are comfortable with the skill may go online to practice long division word problems on the following internet site.
http://www.ixl.com/math/practice/grade-5-divide-by-2-digit-numbers-word-problems

Assessment
Have students return back to their desks to discuss what they learned in today's lesson. Share with the students the plan for the next day's lesson. Say: "Tomorrow we will explore the meaning of remainders in division problems."

Students will complete student resource "Division Strategy Exit Pass" prior to leaving in order to assess their mastery of estimating quotients. See answer key to assess students' understanding.

Day 3

Engagement
Create a miniature version of a carnival game where students will toss a ball into cups with the goal of landing in the center cup for the chance to win a "fish." Ask three students to come to the front of the room. Tell them that you have 16 balls and you are going to give each student a chance to win the prize. Give two students 5 balls and one student 6 balls. Allow students the chance to play the game.

Exploration
- At the completion of the game, ask students: "Did each student have a fair chance to win? I had 16 balls available and three players so I was not able to divide the balls evenly between the three students. Is there a more fair way to have shared the balls with the students?"

Explanation
- Break the class into three groups. Give each group a prompt based on a division problem with a remainder and ask them to create a short skit based on the problems listed on the teacher resource, "Carnival Scenario."
- Students will act out the skits in front of the class. After each presentation, discuss how the remainders were presented in the skit. See answer key for assessment.
- Distribute the student resource "Interpreting Remainder Notesheet." Review and discuss each problem and how the quotient is used.
- Have students work in groups to create another scenario where they are interpreting the remainder following the three ways.
- Have each group share one of their new scenarios with the class.

Application
- Students will work independently to complete the student resource "Interpreting Remainders in Division Problems." The students will need to use skills from Day One and Day Two to complete the worksheet.

Differentiation

Reteach
Students who are struggling with understanding the use of remainders may use resources such as notesheets from previous days. Students may also work with partners or small groups with teacher support and additional practice.

Enrich
Students who are comfortable with the skill may go online to practice long division with interpreting remainders on the following internet site.
http://www.ixl.com/math/practice/grade-5-divide-by-1-digit-numbers-interpret-remainders

Summative Assessment:

The students will complete a summative assessment consisting of constructed response questions based on estimating quotients and long division strategies. The assessment also contains an extended constructed response questions based on interpreting remainders. See answer key for assessment.

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Preassessment

✓ 695 coins ÷ 21 children

Estimate:_____
Solve (show work):

Explain:_____
_____
_____

✓ 5,238 tickets ÷ 12 children

Estimate:_____
Solve (show work):

Explain:_____
_____
_____

Preassessment Answer Key

1. 33 remainder 2
   Explanations will vary but should describe division as separating into equal groups.

2. 436 remainder 6
   Explanations will vary but should describe division as separating into equal groups.

Estimating Quotients Directions

Round the **divisor** to the greatest place value. Leave single digits as single digits.

	Round the Dividend	***Round the Divisor***	***Estimated Quotient***
297 ÷ 5		***5***	

Look at the **dividend**'s first two digits and think of your multiplication facts.

	Round the Dividend	***Round the Divisor***	***Estimated Quotient***
297 ÷ 5	***30***	***5***	

Turn the remaining **dividend** digits into zeros.

	Round the Dividend	***Round the Divisor***	***Estimated Quotient***
307 ÷ 5	***300***	***5***	

Divide the **divisor** into the **dividend** to calculate the **quotient**.

30**0** ÷ 5 =
Think: 30 ÷ 5 = 6
Think: There is one zero left in the dividend, so I need one in my answer.
Estimated Quotient: 60

Check your work by multiplying the **divisor** and the **quotient**.

Check: Multiply the quotient by the divisor to get the dividend.
Think: 60 x 5 = 300

Another Example

Round the **divisor** to the greatest place value.

	Round the Dividend	***Round the Divisor***	***Estimated Quotient***
4397.2 ÷ 62		***60***	

Focus on the tens place in the **divisor**, (6).
Look at the **dividend**'s first two digits and think of your multiplication facts, (42 and 6 are part of a fact family).

	Round the Dividend	***Round the Divisor***	***Estimated Quotient***
4397.2 ÷ 60	***42***	***60***	

Turn the remaining **dividend** digits into zeros and ignore the decimal.

	Round the Dividend	***Round the Divisor***	***Estimated Quotient***
4397.2 ÷ 60	***4200***	***60***	

Divide the **divisor** into the **dividend** to calculate the **quotient**.

42**00** ÷ 60 =

There are zeros in both the dividend and divisor. You can eliminate the fewest amount of zeros that are in both sides. The divisor has one and the dividend has two so you can eliminate one.

Think: 420 ÷ 6= 42 ÷ 6 = 7

Think: There is one zero left in the dividend, so I need one in my answer.

Estimated Quotient: 70

Check your work by multiplying the **divisor** and the **quotient**.

Check: Multiply the quotient by the divisor to get the dividend.

Think: 70 x 60 = 4200 (2 zeros in the factors, so 2 zeros in the product)

Estimating Quotients: Teacher Sample Problems

1. Estimate: 48.54 ÷ 7
2. Estimate: 1726 ÷ 64
3. Estimate: 71.257 ÷ 9
4. Estimate: 779.35 ÷ 24
5. Estimate: 74.247 ÷ 5
6. Estimate: 362.14 ÷ 82
7. Estimate: 52.178 ÷ 9
8. Estimate: 599.26 ÷ 52
9. Estimate: 71.457÷ 8
10. Estimate: 549.29 ÷ 71
11. Estimate: 54.525 ÷ 8
12. Estimate: 71.578 ÷ 6
13. Estimate: 451.67 ÷ 62
14. Estimate: 987.25 ÷ 11
15. Estimate: 978.33 ÷ 78

Estimating Quotients: Teacher Sample Problems Answer Key

1. Estimate: 48.54 ÷ 7 =
   49 ÷ 7 = 7

2. Estimate: 1726 ÷ 64 =
   1800 ÷ 60 = 30

3. Estimate: 71.257 ÷ 9 =
   72 ÷ 9 = 8

4. Estimate: 779.35 ÷ 24 =
   800 ÷ 20 = 40

5. Estimate: 74.247 ÷ 5 =
   75 ÷ 5 = 15

6. Estimate: 362.14 ÷ 82 =
   320 ÷ 80 = 4
   or **400 ÷ 80 = 5**

7. Estimate: 52.178 ÷ 9 =
   54 ÷ 9 = 6

8. Estimate: 599.26 ÷ 52 =
   600 ÷ 50 = 12

9. Estimate: 71.457÷ 8 =
   72 ÷ 8 = 9

10. Estimate: 549.29 ÷ 71 =
    560 ÷ 70 = 8

11. Estimate: 54.525 ÷ 8 =
    56 ÷ 8 = 7

12. Estimate: 71.578 ÷ 6 =
    72 ÷ 6 = 12

13. Estimate: 451.67 ÷ 62 =
    420 ÷ 60 = 7
    or **480 ÷ 60 = 8**

14. Estimate: 987.25 ÷ 11 =
    1000 ÷ 10 = 100

15. Estimate: 978.33 ÷ 78 =
    960 ÷ 80 = 12

Division Cards

79 ÷ 4 =	321 ÷ 15 =	2,122 ÷ 4 =
84 ÷ 7 =	764 ÷ 43 =	6,845 ÷ 8 =
96 ÷ 6 =	233 ÷ 18 =	1,154 ÷ 6 =
34 ÷ 11 =	302 ÷ 53 =	2,105 ÷ 5 =
62 ÷ 13 =	522 ÷ 33 =	6,580 ÷ 20 =
54 ÷ 15 =	859 ÷ 84 =	3,117 ÷ 87 =
61 ÷ 19 =	114 ÷ 26 =	1,421 ÷ 16 =
126 ÷ 8 =	157 ÷ 24 =	7,544 ÷ 63 =

Division Cards

79 ÷ 4 = **80 ÷ 4 = 20** **79÷4=19 r3**	321 ÷ 15 = **320 ÷ 20 = 16** **321÷15= 21r6**	2,122 ÷ 4 = **2,000÷ 4 =500** **2,122÷4=530r2**
84 ÷ 7 = **84 ÷ 7 =12** **84 ÷ 7 =12**	764 ÷ 43 = **760 ÷ 40 =19** **764÷43=17r33**	6,845 ÷ 8 = **6,400 ÷ 8 =800** **6,845÷8=855r5**
96 ÷ 6 = **96 ÷ 6 =16** **96 ÷ 6 =16**	233 ÷ 18 = **200 ÷ 20 =10** **233÷18=12r17**	1,154 ÷ 6 = **1,200 ÷ 6 =200** **1,154÷6=192r2**
34 ÷ 11 = **30 ÷ 10 = 3** **34÷11= 3r1**	302 ÷ 53 = **300 ÷ 50 =6** **302÷53 =5r37**	2,105 ÷ 5 = **2,000 ÷ 5 =400** **2,105 ÷ 5 =421**
62 ÷ 13 = **60 ÷ 10 =6** **62÷13=4r10**	522 ÷ 33 = **510 ÷ 30 =17** **522÷33=15r27**	6,580 ÷ 20 = **6,600÷ 20=330** **6,580÷20=329**
54 ÷ 15 = **60 ÷ 20 =3** **54÷ 15=3r9**	859 ÷ 84 = **880 ÷ 80 =11** **859÷84=10r19**	3,117 ÷ 87 = **2,700 ÷ 90 =30** **3,117÷87=35r72**
61 ÷ 19 = **60 ÷ 20 =3** **61÷ 19=3r4**	114 ÷ 26 = **120 ÷ 30 =4** **114÷ 26=4r10**	1,421 ÷ 16 = **1,400 ÷ 20 =70** **1,421÷16=88r13**
126 ÷ 8 = **160 ÷ 8 =20** **126÷8=15r6**	157 ÷ 24 = **160 ÷ 20 =8** **157÷ 24=6r13**	7,544 ÷ 63 = **7,800 ÷ 60=130** **7,544÷63=119r47**

Reteach Division Cards

80 ÷ 4 =	315 ÷ 15 =	2,120 ÷ 4 =
84 ÷ 7 =	731 ÷ 43 =	6,840 ÷ 8 =
96 ÷ 6 =	216 ÷ 18 =	1,152 ÷ 6 =
33 ÷ 11 =	265 ÷ 53 =	2,105 ÷ 5 =
52 ÷ 13 =	495 ÷ 33 =	6,580 ÷ 20 =
45 ÷ 15 =	840 ÷ 84 =	3,045 ÷ 87 =
57 ÷ 19 =	104 ÷ 26 =	1,408 ÷ 16 =
120 ÷ 8 =	144 ÷ 24 =	7,497 ÷ 63 =

Reteach Division Cards

80 ÷ 4 = **80 ÷ 4 =20** **80 ÷ 4 =20**	315 ÷ 15 = **300 ÷ 20 =15** **315 ÷ 15 =21**	2,120 ÷ 4 = **2,000÷ 4 =500** **2,120÷ 4 =530**
84 ÷ 7 = **80 ÷ 8 =10** **84 ÷ 7 =12**	731 ÷ 43 = **720 ÷ 40 =18** **731 ÷ 43 =17**	6,840 ÷ 8 = **6,400÷ 8 =800** **6,840÷ 8 =855**
96 ÷ 6 = **96 ÷ 6 =16** **96 ÷ 6 =16**	216 ÷ 18 = **200 ÷ 20 =10** **216 ÷ 18 =12**	1,152 ÷ 6 = **1,200÷ 6 =200** **1,152÷ 6 =192**
33 ÷ 11 = **30 ÷ 10 = 3** **33 ÷ 11 = 3**	265 ÷ 53 = **250 ÷ 50 =5** **265 ÷ 53 =5**	2,105 ÷ 5 = **2,000÷ 5 =400** **2,105÷ 5 =421**
52 ÷ 13 = **50 ÷ 10 =5** **52 ÷ 13 =4**	495 ÷ 33 = **450 ÷ 30 =15** **495 ÷ 33 =15**	6,580 ÷ 20 = **6,600÷ 20=330** **6,580÷ 20=329**
45 ÷ 15 = **40 ÷ 20 =2** **45 ÷ 15 =3**	840 ÷ 84 = **840 ÷ 84 =10** **840 ÷ 84 =10**	3,045 ÷ 87 = **2,700÷ 90=30** **3,045÷87=35**
57 ÷ 19 = **60 ÷ 20 =3** **57 ÷ 19 =3**	104 ÷ 26 = **120 ÷ 30 =4** **104 ÷ 26 =4**	1,408 ÷ 16 = **1,400 ÷ 20=70** **1,408 ÷ 16=88**
120 ÷ 8 = **160 ÷ 8 =20** **120 ÷ 8 =15**	144 ÷ 24 = **140 ÷ 20 =7** **144 ÷ 24 =6**	7,497 ÷ 63 = **7,200÷60=120** **7,497÷63=119**

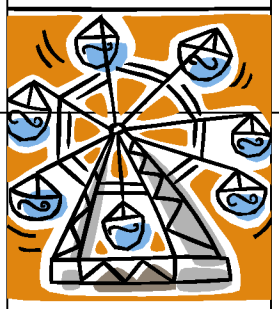
Enrichment Division Cards

$559.6 \div 64 =$	$485.3 \div 72 =$	$239.6 \div 34 =$
$819.4 \div 86 =$	$642.3 \div 76 =$	$356.1 \div 92 =$
$921.6 \div 65 =$	$23.3 \div 18 =$	$115.2 \div 68 =$
$3.4 \div 11 =$	$30.2 \div 53 =$	$2{,}105 \div 51 =$
$62.8 \div 13 =$	$522.8 \div 33 =$	$65.80 \div 20 =$
$5.8 \div 15 =$	$859 \div 84 =$	$3{,}417 \div 87 =$
$612 \div 19 =$	$114 \div 2.6 =$	$1{,}421 \div 16 =$
$12.6 \div 8 =$	$157 \div 24 =$	$754.4 \div 63 =$

Enrichment Division Cards

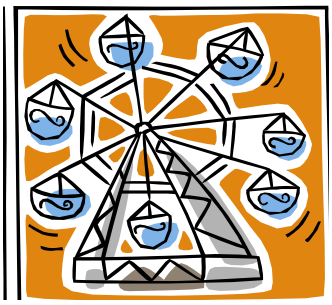
559.6 ÷ 64 = **540 ÷ 60 = 9**	485.3 ÷ 72 = **490 ÷ 70 = 7**	239.6 ÷ 34 = **240 ÷ 30 = 8**
819.4 ÷ 86 = **810 ÷ 90 = 9**	642.3 ÷ 76 = **640 ÷ 80 = 8**	356.1 ÷ 92= **360 ÷ 90 = 4**
921.6 ÷ 65 = **910 ÷ 70 = 13**	23.3 ÷ 18 = **20 ÷ 20 = 1**	115.2 ÷ 68 = **140 ÷ 70 = 2**
3.4 ÷ 11 = **3.0 ÷ 10 = .3**	30.2 ÷ 53 = **30.0 ÷ 50 = .6**	2,105 ÷ 51 = **2,000÷ 50=40**
62.8 ÷ 13 = **60 ÷ 10 = 6**	522.8 ÷ 33 = **510 ÷ 30 = 17**	65.80 ÷ 20 = **60 ÷ 20 = 3**
5.8 ÷ 15 = **6.0 ÷ 20 = .3**	859 ÷ 84 = **880 ÷ 80 =11**	3,417 ÷ 87 = **3,600÷ 90 =40**
612 ÷ 19 = **600 ÷ 20 = 30**	114 ÷ 2.6 = **120 ÷ 3 = 40**	1,421 ÷ 16 = **1,400÷ 20 =70**
12.6 ÷ 8 = **16 ÷ 8 = 2**	157 ÷ 24 = **160 ÷ 20 = 8**	754.4 ÷ 63 = **780 ÷ 60 =13**

Estimating Quotients Bingo



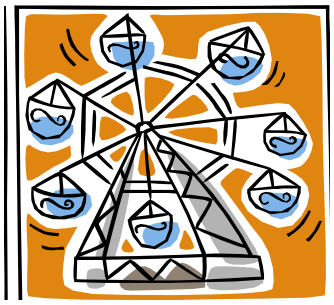
Estimate the Quotient
Exit Pass

1. 122 ÷ 3 =
2. 4125 ÷ 6 =
3. 3209 ÷ 7 =
4. 26,834 ÷ 4.8 =
5. 484 ÷ 64 =



Estimate the Quotient
Exit Pass

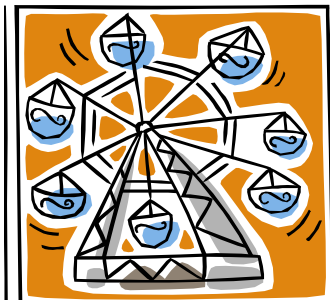
1. 122 ÷ 3 =
2. 4125 ÷ 6 =
3. 3209 ÷ 7 =
4. 26,834 ÷ 4.8 =
5. 484 ÷ 64 =



Estimate the Quotient

Exit Pass

Answer Key



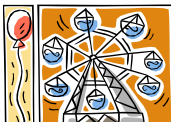
1. 122 ÷ 3 = **120 ÷ 3 = 40**

2. 4125 ÷ 6 = **4200 ÷ 6 = 700**

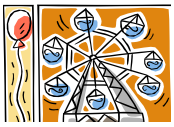
3. 3209 ÷ 7 = **3500 ÷ 7 = 500**

4. 26,834 ÷ 4.8 = **25,000 ÷ 5 = 5,000**

5. 484 ÷ 64 = **480 ÷ 60 = 8**



Division Strategies Notesheet



Division is:_____

_____

1532 ÷ 13 = _____

Traditional Algorithm Strategy

$$13\overline{)1532}$$

Thinking Line Strategy

13 | 1532

13 x 1 = 13
13 x 10 = 130
13 x 100=1300

13 x 2 = 26
13 x 20 = 260
13 x 200 = 2600

✓ Which of the two strategies do you feel more comfortable using to solve long division problems? How does it help you solve the problem accurately?

_____

_____

_____

_____

_____

Curly's Calculating Carnival

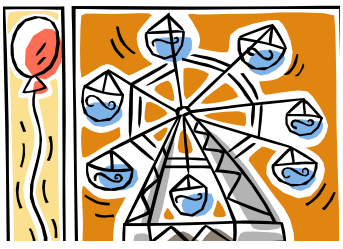
Dynamite Division

Materials:

- Game Board
- Division Problem Cards
- Chip or marker
- Calculator

Directions:

1. Students will place the Decimal Problem cards in a pile face down beside the game board.
2. The students will take turns drawing a card and solving the problems on white erase boards or notebook paper. Once they have completed the problem, they will share their answer with their partner who will check the answer on a calculator.
3. If the student has the correct quotient, they may move forward on the game board 2 spaces. If the quotient is incorrect the student will have a chance to correct the problem and have it checked again. If the answer is correct on the second try, the student may move forward 1 space. If the problem is still incorrect, the student must stay in the same space.
4. The first person to reach the finish line is the winner.



Dynamite Division Cards

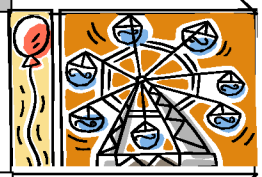
79 ÷ 4 =	321 ÷ 1 5 =	2,122 ÷ 4 =
84 ÷ 7 =	764 ÷ 43 =	6,845 ÷ 8 =
96 ÷ 6 =	233 ÷ 18 =	1,154 ÷ 6 =
34 ÷ 11 =	302 ÷ 53 =	2,105 ÷ 5 =
62 ÷ 1 3 =	522 ÷ 33 =	6,580 ÷ 2 0 =
54 ÷ 15 =	859 ÷ 84 =	3,117 ÷ 87 =
61 ÷ 19 =	114 ÷ 26 =	1,421 ÷ 16 =
126 ÷ 8 =	157 ÷ 24 =	7,544 ÷ 63 =

Curly's Calculating Carnival

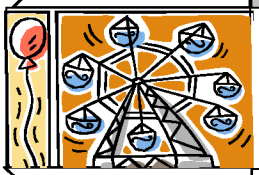
Dynamite Division

Start

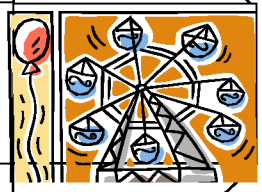
Move forward two spaces



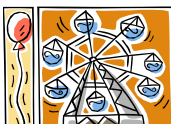
BONUS POINT



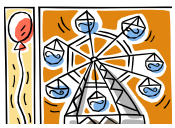
Go back four spaces



Finish

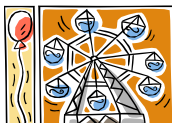


Division Strategy Exit Pass

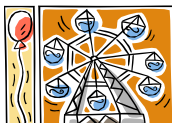


There were 1,440 tickets sold on Tuesday at the carnival. There were 45 children who bought tickets that day. How many tickets did each child buy if they each bought the same amount of tickets?

Show your work using one of the two strategies learned in class today.



Division Strategy Exit Pass



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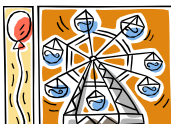
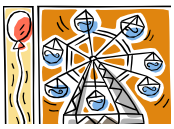


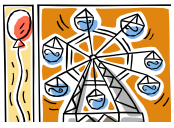
Division Strategy Exit Pass
Answer Key



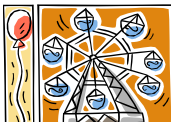
There were 1,440 tickets sold on Tuesday at the carnival. There were 45 children who bought tickets that day. How many tickets did each child buy if they each bought the same amount of tickets?

Show your work using one of the two strategies learned in class today.

```
     32
45 1440
   -135
     90
    -90
      0
```



Division Strategy Exit Pass
Alternate Answer



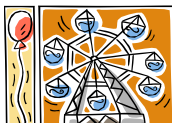
There were 1,440 tickets sold on Tuesday at the carnival. There were 45 children who bought tickets that day. How many tickets did each child buy if they each bought the same amount of tickets?

Show your work using one of the two strategies learned in class today.

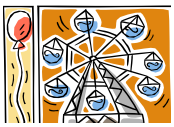
```
45 1440
 - 900   20
   540
  -450   10
    90
   -45    1
    45
   -45    1
     0
```

45 x 1 = 45
45 x 10 = 450
45 x 100 = 4500

45 x 2 = 90
45 x 20 = 900
45 x 200 = 9000



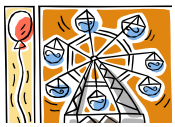
Carnival Scenarios: Interpreting Remainders



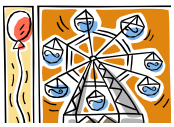
There are 8 clowns and they all need to ride in miniature clown cars. No more than 3 clowns can fit into a car. How many cars are needed for the clowns?

At the carnival you spin a candy wheel to win packs of fruit chews with 12 candies in each package. You end up winning 5 packs of candy but you have to share it with your brother and your sister. How many pieces of candy will each of you get?

You bought 15 tickets at the carnival to get on rides. Each ride requires 2 tickets. How many rides can you go on?



Carnival Scenarios: Interpreting Remainders Answer Key



There are 8 clowns and they all need to ride in miniature clown cars. No more than 3 clowns can fit into a car.

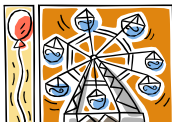
Answer: 2 remainder 2 but 3 cars are needed

At the carnival you spin a candy wheel to win packs of fruit chews with 12 candies in each package. You end up winning 5 packs of candy but you have to share it with your brother and your sister.

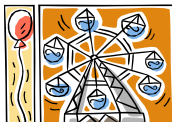
Answer: 1 remainder 2 but each child will get 1 whole pack and 8 individual pieces of candy

You bought 15 tickets at the carnival to get on rides. Each ride requires 2 tickets.

Answer: 7 remainder 1 but you cannot ride with only 1 ticket so discard it



Remainder Notesheet



Often when we divide numbers the quotients contain a remainder. In real life, we don't have remainders, so what do we do with them?

Round Up

Example: There are 8 clowns and they all need to ride in miniature clown cars. No more than 3 clowns can fit into a car.
Answer: 2 remainder 2, but 3 cars are needed

Create your own:

Split Evenly

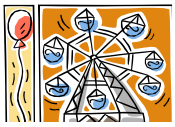
Example: At the carnival you spin a candy wheel to win packs of fruit chews with 12 candies in each package. You end up winning 5 packs of candy but you have to share it with your brother and your sister.
Answer: 1 remainder 2, but each child will get 1 whole pack and 8 individual pieces of candy

Create your own:

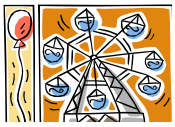
Dropped and Discard

Example: You bought 15 tickets at the carnival to get on rides. Each ride requires 2 tickets.
Answer: 7 remainder 1, but you cannot ride with only 1 ticket so discard it

Create your own:



Interpreting Remainders in Division Problems



Goals:

- Practice Division skills
- Determine what to do with remainders

Practice:

There are 14 clowns at the carnival. The president of the carnival just purchased 91 brand new juggling balls for the clowns. Clowns are kind and they would want to be fair and share the juggling balls equally. How would you divide the juggling balls fairly between the clowns?

Estimate:_____

Solve (show work):

Explain what the remainder means in this problem:_____

_____

_____

_____

_____

The funnel cake boss made 204 funnel cakes. Sixty-one families ordered an equal amount of funnel cakes. Each family ordered at least two funnel cakes. How many funnel cakes did each family order?

Estimate:_____

Solve (show work):

The carnival staff is excited because any remaining funnel cakes are distributed to the workers at the end of the day. How many funnel cakes are distributed to the workers? If there are 10 workers waiting to get funnel cakes, will they each be able to get an equal amount?

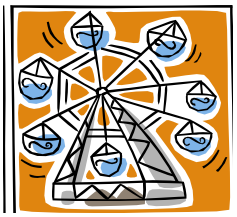
Explain what the remainder means in this problem:_____

_____

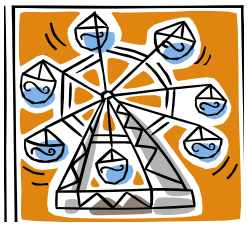
_____

_____

_____



Calculating Carnival Division Assessment



Estimate Quotients

1. 559 ÷ 64 = _____

2. 485 ÷ 72 = _____

3. 239 ÷ 34 = _____

4. 819 ÷ 86 = _____

5. 642 ÷ 76 = _____

6. 356 ÷ 92 = _____

7. Explain why the following estimate is <u>not</u> reasonable.

356 ÷ 63 is about 3

_____

_____

_____

_____

_____

_____

_____

Long Division

Divide each problem. Show all work and make sure to check your work when finished.

8. 579 ÷ 23 =

9. 2,118 ÷ 72 =

10. 846 ÷ 12 =

Division ECR

While at the carnival you decide to ride the ferris wheel, the swings, the hurricane, and the zipper. Each ride requires 4 tickets. You can buy tickets in packs of ten. You decide to buy 20 tickets.

Part A How many rides can you go on with those tickets? Show all work below.

Part B

- Use what you know about division and interpreting remainders to explain why your answer is correct.

- You finished the four rides you wanted to go on. Now, your best friend wants you to walk through the haunted house with her. This will cost you 5 tickets. Do you have enough tickets to go with her? Why or why not?

_____

_____

_____

_____

_____

_____